

FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

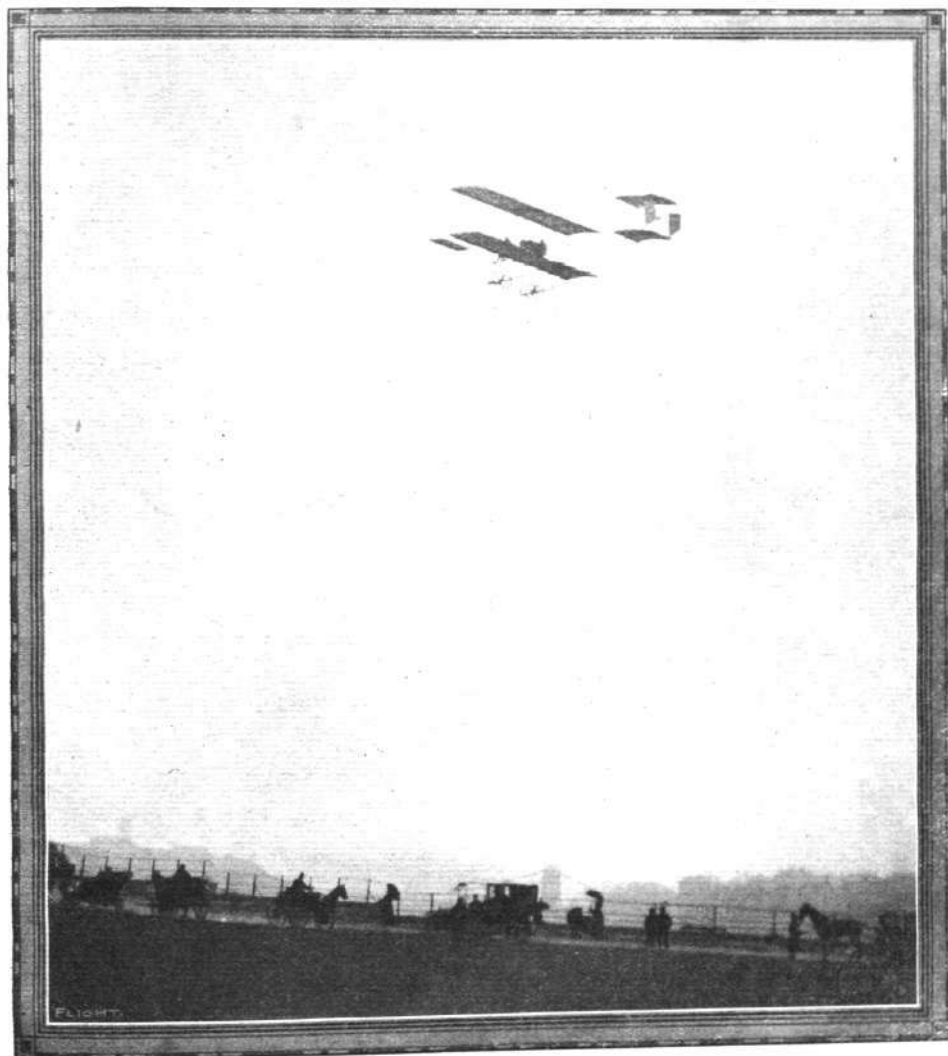
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FLYING OVER THE AVON GORGE.—Monsieur Tetard flying a "Bristol" biplane over the Avon Gorge recently, as reported in these pages.

OCTAVE CHANUTE. 1832-1910.

OCTAVE CHANUTE is dead, and one of the greatest pioneers of flight has closed a long and honoured association with the world's progress. Born in Paris on February 18th, 1832, Chanute was over 78 years old when he passed away at his Chicago residence on Thursday of last week, November 24th. The greater part of his life he spent in America, and spent it to such purpose, indeed, that before he took any active part in the furtherance of aviation he had already attained to the head of his profession as civil engineer. His particular work was the construction of railways, and at different periods he was engineer-in-chief to many of the principal and now famous trunk systems of that great country. Sometimes he found himself in charge of the construction of two or more lines at the same time, as, for instance, when he was chief engineer of a section of the Kansas City, Fort Scott, and Gulf Railway; the Leavenworth, Lawrence and Galveston Railroad; a connecting line between these two belonging to the Santa Fé; and a northern section of the Atchison and Nebraska Line. Among other positions, he occupied for a period of ten years the post of chief engineer to the Erie Railway, and by his brother professional men was in due course honoured with the Presidency of the American Society of Civil Engineers. It is only proper to refer to these attainments, because Chanute did not associate himself actively with the progress of flight until his later years, when he had retired from the more exacting duties of his profession; and many students of aviation may possibly be unaware of what type of man it was who thus gave his unstinted support to the inception of a movement that was then not only embryonic in its infancy, but commonly regarded as having a very problematical future.

Attracted to a study of the principles underlying flight, Octave Chanute adopted in the first instance the eminently practical proceeding of passing in review the experiments of others in order to find out whereabouts he might most properly commence research on his own account and in what direction it might be most profitably pursued. These researches, originally taking the form of articles, subsequently developed into his famous work entitled "Progress in Flying Machines," which was published in New York in 1894, and has for some time been out of print. It is, without question, the most valuable work of its kind in existence, for it consists of a very close although very concise study of practically every experiment in aviation that had been made up to that time.

Octave Chanute, however, was not content with learning about the experiments of others, for he was keen on furthering progress by his own practical work and he decided to give such time as he could to that purpose. Like Lilienthal, he grasped the importance of gliding flight, and having published an article strongly recommending others to pursue this art, he decided to institute practical experiments, if not exactly personally—for he was already 64 years of age—at any rate at his personal expense. He therefore secured the services of A. M. Herring, a much younger enthusiast than himself, who had previously made some gliding flights of his own on a Lilienthal apparatus in 1894. This machine Herring rebuilt, and also another on very different lines, suggested by Chanute. The apparatus was completed in June, 1896, and transferred to a suitable site on the shores of Lake Michigan, near St. Joseph, for trial. Chanute's glider consisted of no fewer than six pairs of wings, and

experiments were conducted to find the most satisfactory disposition of the surfaces, of which five pairs of wings were ultimately superposed, while the sixth pair formed a tail. The most important new principle introduced into Chanute's glider, however, was that of maintaining equilibrium by means of moving the wings instead of the pilot. Lilienthal maintained his balance in the air by moving his body, within the frame of the machine, in any direction that might be required, and the long continued success of his experiments was unquestionably due in a large measure to his gymnastic skill and strength in performing these evolutions. Chanute, on the contrary, made the surfaces movable instead of the man, and inasmuch as his machine was designed so that the movement in question should take place automatically—that is to say, without any action of control on the part of the pilot—it is to Chanute that we must give the credit of having first definitely attempted to produce a naturally stable machine. Reasonable success attended experiments with this device, but the principal idea of Chanute and his assistants being, apparently, to try various schemes, other machines were also built and tested. One of them was a biplane trussed with struts and diagonal wire bracing, which became, therefore, the prototype of the modern machine of this class. Chanute's experiments lasted until September of that year, (1896) when the camping party broke up for the winter, and they were not afterwards renewed. Chanute was even then 64 years of age, and although attracted to such experiments with all the fervour of youth he doubtless deemed it wise to moderate his personal participation in such experience. Moreover, the trials had served their purpose so far as Chanute was concerned and their results coming from such an authority in the engineering world induced a widespread interest in the subject.

Although ceasing experiments on his own behalf, Chanute maintained an unabated interest in the practical side of the subject, and, good sportsman that he was, he went into camp with the Brothers Wright when they established themselves at Kitty Hawk in the summer of 1900. Chanute stayed with the Brothers Wright for about a week, and the close association of these three minds must have been an important factor in the rapid development of the Wright machine. Indeed, it has always seemed to us that Chanute's active interest in the subject at large was of greater service to its development than his own active work, useful as that was, for he was acquainted with the researches of everyone and he knew most of the workers of his own time between whom and whose work he helped to forge links whereby we can now see and take advantage of the uninterrupted chain of practical experience that was commenced by Lilienthal and was first coupled up to the train of modern civilisation by the historic achievement of power-driven flight on the part of the Brothers Wright in December, 1903.

It is not given to everyone to see the fruition of their ideals as Octave Chanute saw them in the success of aviation, especially when they are already advanced in years when the art in question has scarcely begun. Chanute, however, must have seen many interesting changes in his life, for it extended over a period that covered the introduction of almost every modern convenience. That a man born in the "thirties" should end his days honoured as a pioneer of flight, is itself an all sufficient tribute to the calibre of his mind—to the progressive spirit of Octave Chanute.

FLIGHT PIONEERS.

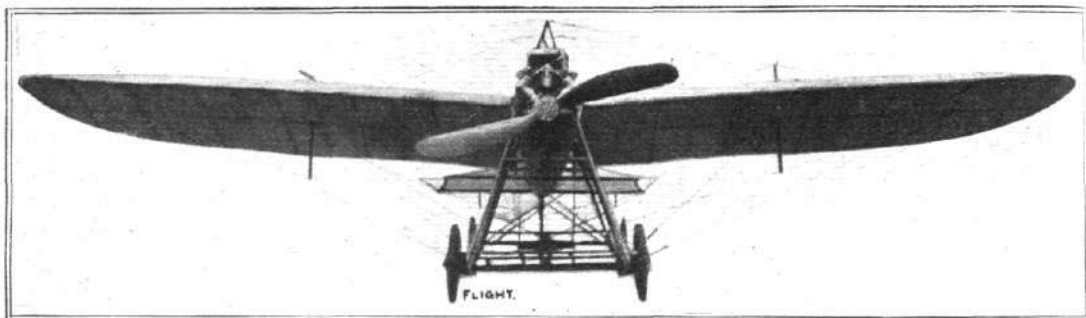


MR. THOMAS SOPWITH.

THE HANRIOT MONOPLANE.

WHEREVER it has been seen, the Hanriot monoplane has invariably attracted attention, and more often than not received favourable criticism of its shipshape appearance. And, now that it is about to

be appreciated individually as such by those on whom their *l'ensemble* makes a good impression. First and foremost there is, of course, the wooden boat-shaped hull, that naturally strikes everyone

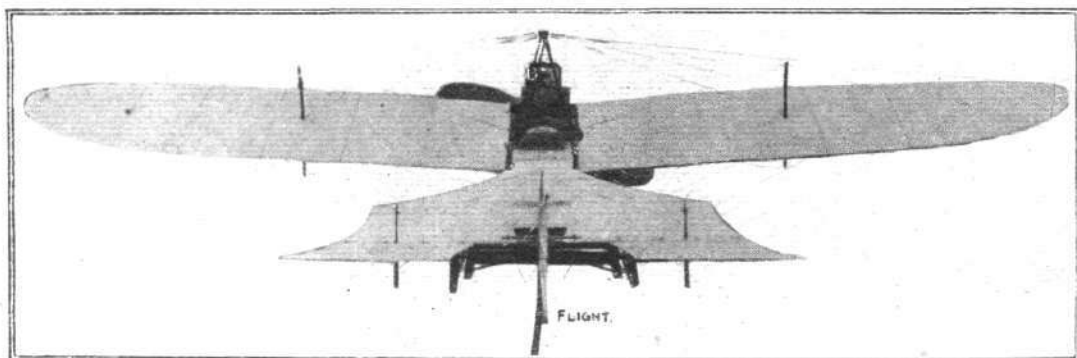


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Front view of the Hanriot monoplane, showing the "A" type chassis frame that was introduced by this firm last year.

be brought to the fore in this country under the aegis of a powerful syndicate, the interest that it has awakened in the capacity of a mere "visitor" at some of our flight meetings is likely to mature in a

at first sight as the outstanding departure from orthodox practice, but there is also the "A" type frame that supports this body upon the wheel and skid chassis, and those who attended the previous

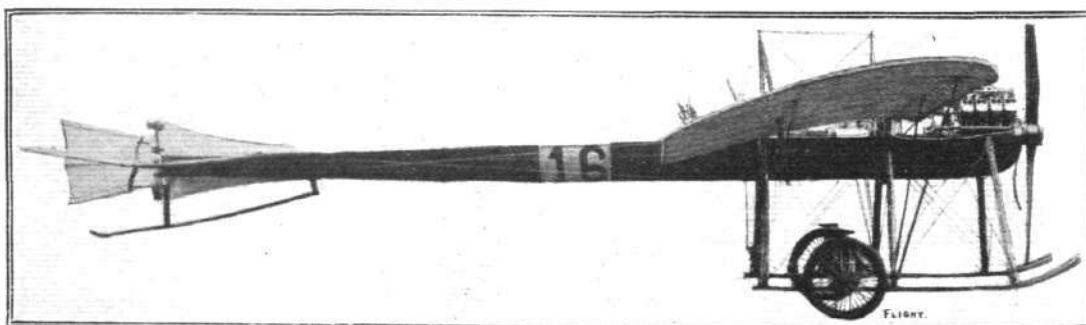


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Rear view of the Hanriot monoplane, showing the bird-like tail and the dihedral angle of the wings.

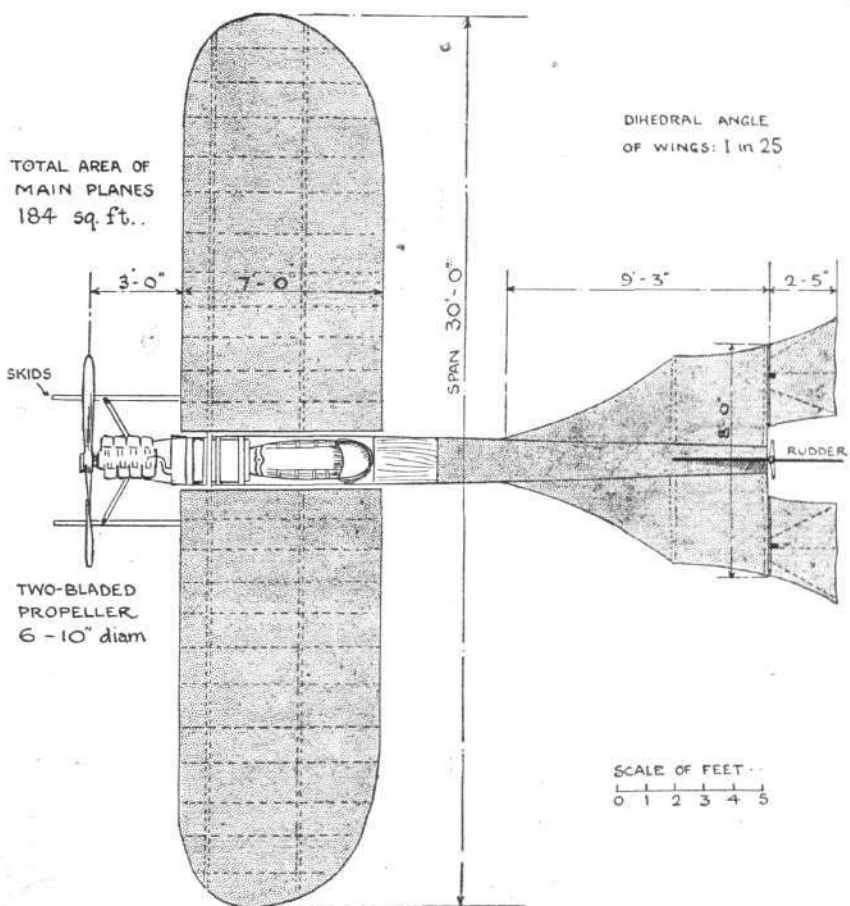
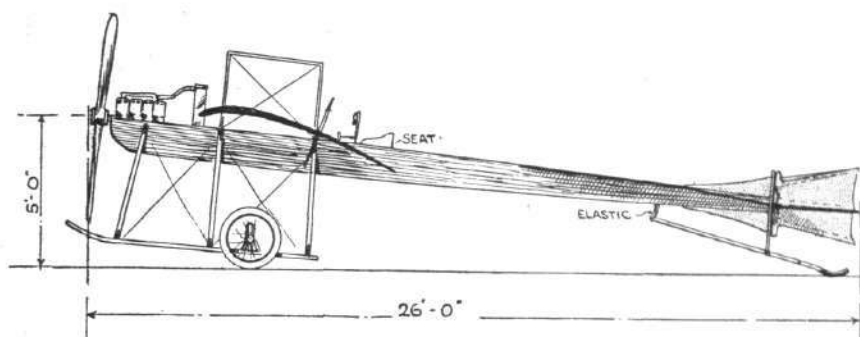
more practical form among those who have an ambition to fly. There are many points of distinct originality in the Hanriot design and construction, but it is not always that these features in question

Paris Aero Show will doubtless remember that a similar feature of construction characterised the Hanriot monoplane of last year. Those who were not actually present at that Exhibition, but who



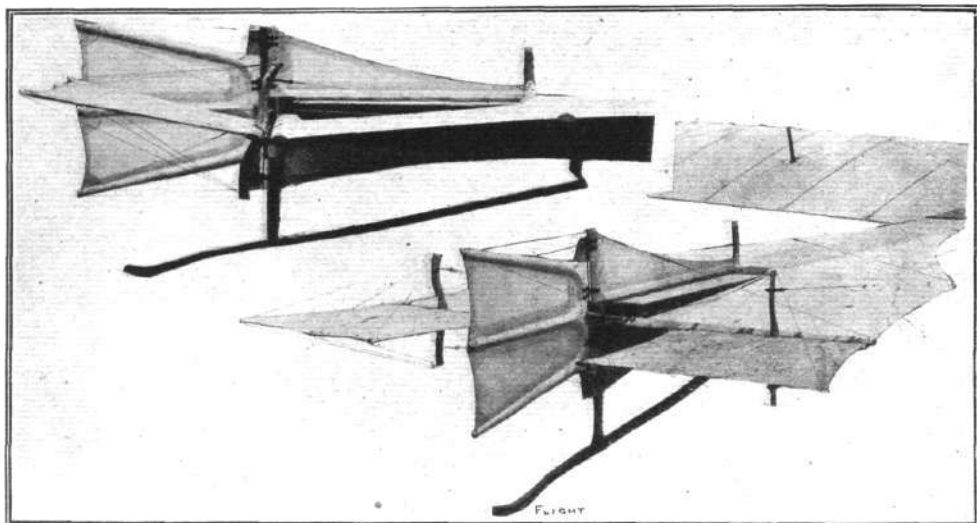
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Side view of the Hanriot monoplane. The disposition of the parts is such that the machine is practically in equilibrium when balanced on its supporting wheels. There is very little weight on the trailing skid with the aeroplane in the above position.



The Hanriot monoplane, 1910.

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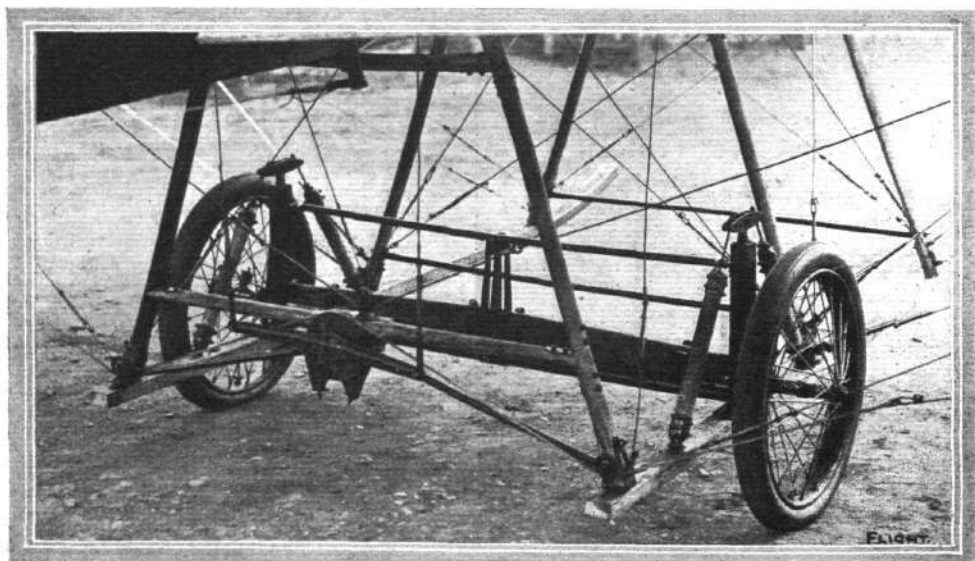
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Two views of the Hanriot tail. In the side view the deflected trailing portion can be distinctly observed.

care to turn up their first volume of *FLIGHT*, will find our own illustration and description of the machine on page 740 of our November 20th issue, 1909. It was, in our opinion, one of the most interesting constructional details that the Paris Aero Show brought to light. Simple in design and construction, strong in principle, it formed a clever solution to a problem that it has not been easy to turn into a really neat job; that the method has been generally appreciated may be judged from the fact that several other makers of monoplanes subsequently adopted the essential features of this design.

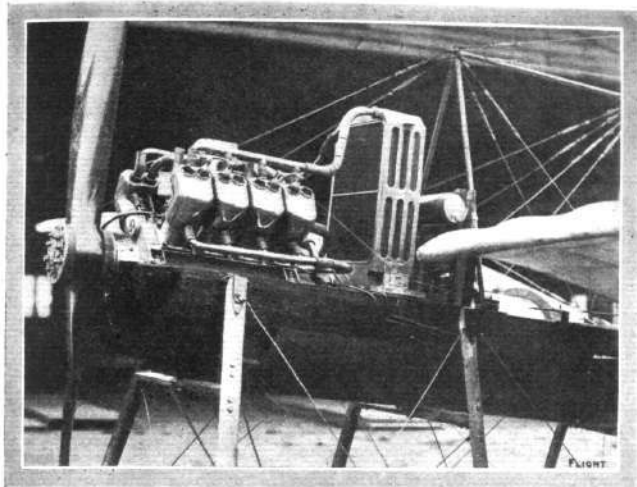
There is also a good deal to be said in favour of the boat body on the Hanriot monoplane, and quite apart from any intrinsic merit that this system of construction may possess on its own account, there is a distinct advantage in the system in that it dispenses with

the use of a tremendous amount of wire that would otherwise be necessary for bracing some equivalent girder member. We have no objection to wire in principle, and unquestionably it is a wonderfully strong and light method of building up a frame; but on the modern aeroplane there is so much wire that any method of reducing the amount is welcome on this score alone. Wire bracing needs some little attention, for it should at least be periodically inspected, and if more wire is used than is absolutely necessary it seems to us that there is just the likelihood that it may provoke carelessness with regard to its proper maintenance. By the use of a boat body, the Hanriot monoplane is clear of all wire for which a suitable substitute can be provided, and those wires that do remain take on, in consequence, an added importance that should ensure their proper attention. It may, perhaps, seem a little outside the zone of



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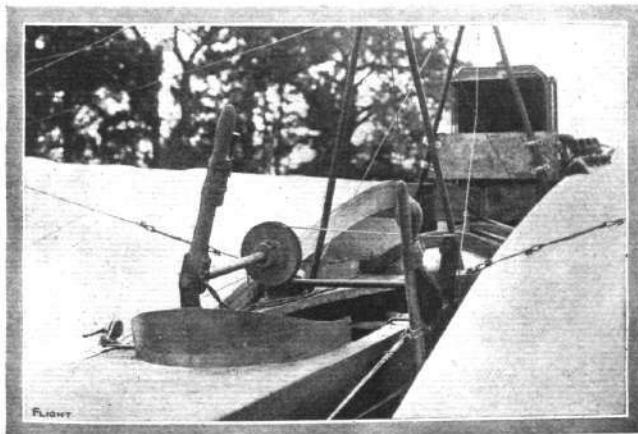
View showing the method of mounting the axle on the Hanriot monoplane. The axle is carried between vertical guides, and the machine is suspended on the rubber springs that are anchored to the skids.



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View of the 8-cyl. E.N.V. engine in place on the Hanriot monoplane.

present day conditions to bring forward a criticism of this description, but it must after all be remembered that manufacturers essentially hope to obtain a fairly wide sale for their machines, and many aeroplanes are quite likely to pass into the hands of users who will not always realise the necessity of persistent attention to small mechanical points while their chief object is to get up into the air. The wider and the more rapid the development of aviation, the more is this likely to be the case—as it has been, for instance, in connection with motor cars—so that in considering the construction of machines, it is necessary, even now, to take note of features such as these, because of the influence that they may have on future design.



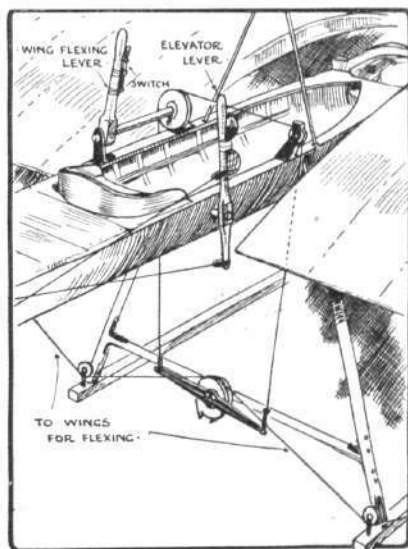
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View of the pilot's seat on the Hanriot monoplane. The lever on the left warps the wings, that on the right operates the tail-elevator. There is a pivoted foot-rest in front controlling the rudder. The switch is mounted on the warping-lever, and a rubber bulb for maintaining pressure in the petrol tank is attached to the elevator-lever. The hinging of the rear spars to the body can just be distinguished in the above illustration.

The boat body of the Hanriot monoplane is constructed on the lines of a racing skiff, and it is well known that this form of construction produces a very strong and very light girder. The top of the body is entirely decked in, except for a little cockpit containing the pilot's seat. Immediately behind the pilot's seat the

deck is thickened so that it is safe for the pilot to stand thereon when mounting and dismounting. No wires of any description interfere with free access to this part of the machine. Three steel strips form a kind of cradle for the support of the body on the "A" type chassis frame, the strips being bolted to the inclined struts of the frame and passing under the body as shown in one of the accompanying sketches. Steel strips are also employed for lashing the main spars of the wings to the body, and it will be observed in the same sketch how these spars are mounted on blocks and lashed in place as described. The spars are not horizontal, but are set at an angle to one another, the "dihedral" being 7 ins., that is to say, the extremities of the wings rise 7 ins. above the shoulders. The spars in question are 3 ins. deep and 1½ ins. wide, and they are constructed on the three-ply principle instead of being cut from one piece of wood. This is a departure from common practice that we have not noticed elsewhere, and in view of the criticism that has been levelled against the supposed tendency of monoplane wing spars to buckle, this method of construction will doubtless arouse interest. The laminae of the spars are arranged vertically, but again bearing in mind the matter just referred to, it is conceivable that some use might be made of this principle with horizontal laminae to strengthen the spars against the forward pressure; it is the end thrust on a machine that is the difficult force to meet. The vertical forces can be more readily provided for because the presence of the propeller in no way interferes with any system of bracing that may be preferred. In the Hanriot monoplane it is worthy of note that the rear spars of the main wings are individually trussed by a diamond bracing, each spar being fitted with a vertical cross strut in the centre and the four extremities being tied by diagonal wires. The rear spars are hinged to the frame so that they can rock for wing warping, and the hinge pins are tied together by a steel tube so as to relieve the body of undue strain.

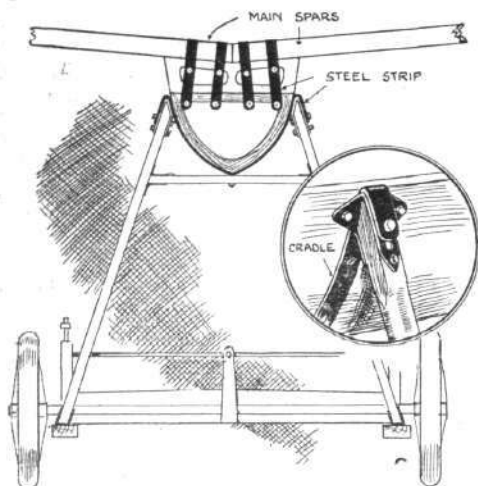
The control of the Hanriot monoplane is mainly interesting on account of the use of two levers, one under the control of the pilot's



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Diagrammatic sketch illustrating the system of hand control on the Hanriot monoplane. A pivoted foot-bar, not shown, operates the rudder.

left hand and the other under the control of his right hand. That on the left moves sideways and operates the wing warping, that on the right moves to and fro and controls the elevator that forms a hinged extension of the tail plane. In front of the pilot's seat is a pivoted cross-bar that can be rocked by the pressure of his feet.



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Sketch illustrating the attachment of the front spars to the body of the Hanriot monoplane and the method of carrying the body itself in a cradle of steel straps.



Now it is Settled!

No doubt the heart of the staunchest supporter of aviation will flag when he hears that at last week's meeting of the City of London College Debating Society a resolution to the effect "That this Society is unable to see that any real benefit to mankind is likely to result from the development of aviation," was passed by a substantial majority. The mover of the resolution, Mr. S. S. Hosking, although he very graciously thought man's desire to fly a reasonable one, doubted whether the risk and expense were likely to result in a corresponding benefit to mankind. The value of the aeroplane in war might be great, but for the purpose of commerce it would never be of much use. Amongst those who assisted at this merciless annihilation of aviation were: Mr. H. Owen, Mr. G. P. Ridley, Mr. M. F. Cahill, Mr. T. G. Harper, B.A., Mr. A. G. Dryden, Mr. P. R. Higgins, Mr. G. L. Precious, Mr. C. L. Cocks, and Mr. W. J. Spray.

This controls the rudder, which is mounted between the halves of the elevator. The fixed tail-plane on the Hanriot monoplane is quite flat, and consists of a sheet of fabric tightly stretched by the aid of a couple of transverse spars. The rear portion of the tail plane is deflected a little below the line of the leading portion, to which it has a relative, although small, angle of incidence.

Well forward of the main planes is the engine, which on this machine is an 8-cyl. 40-h.p. E.N.V. This is mounted in the bows of the boat body, and is also partly supported by the struts of the "A" frame, a pair of which are situated immediately beneath the motor. The tractor-screw, which is direct-driven by the engine, is 2.1 metres in diameter, and 1.2 metres in pitch. When at rest on the ground, the machine is carried by a pair of pneumatic-tyred wheels in front and by a light trailing-skid behind. The wheels are mounted on a steel axle that is reinforced by a wood batten and mounted in vertical guides, so that it has a considerable upward travel. Suspension is effected by elastic springs anchored to the main skids and attached to the upper end of a column that rests upon the axle itself.

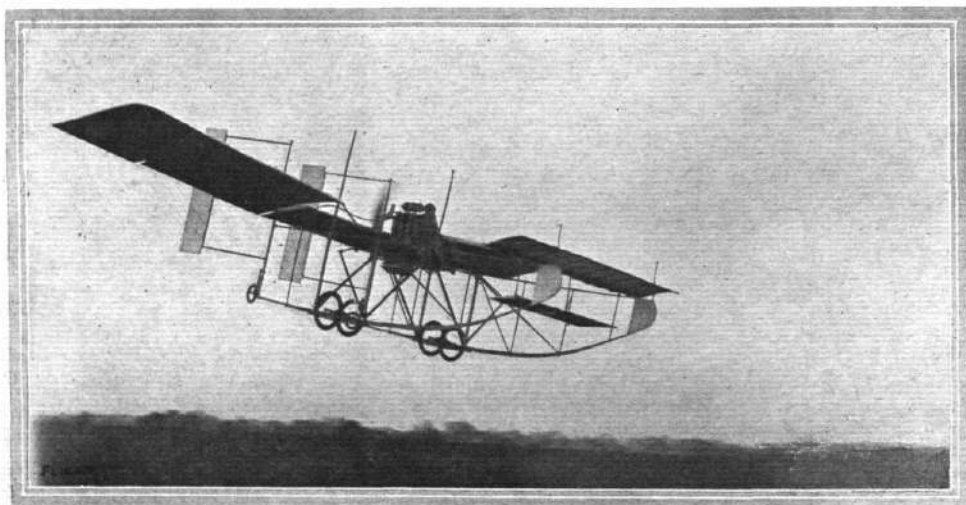
The construction of the axle is shown very clearly in one of our photographs, in which it will be observed that the system represents a very strong but rather rigid form of construction; rigid, that is to say, so far as lateral stiffness is concerned, for the vertical play permitted by the guides is considerably in excess of that usually obtained with the ordinary rubber attachment of the axle to the skids. The clearance is enough, in fact, to enable the wheels to rise up so high as to enable the weight to be taken directly on the skids in the event of a very severe bump. Like everything else in the Hanriot design, solidity seems to be the keynote of its construction.

It is with a machine of this type that some very satisfactory flights have been made at Brooklands recently.



Keen Rivalry between Aviatrixes.

DURING the current month there is likely to be some keen competition between Mdle. Marvingt and Mdle. Dutrieu, both of whom have set their hearts upon the Coupe Femina offered by the Parisian ladies' paper for the best flight by a lady flyer before the end of the year. On Sunday afternoon Mdle. Marvingt rose on her Antoinette monoplane at Mourmelon, and keeping at a height of about 40 metres she circled round and round the ground for 53 mins., thus easily beating the duration record which had been held up to then by Mme. de la Roche. The cold was intense, but the intrepid lady was well protected by furs, and although the gusty wind was a little troublesome at times the monoplane kept on its course very regularly, the turns being taken very wide, which accounts for the fact that the distance completed was only recorded as 35 kiloms. Having obtained her pilot's certificate, Mdle. Dutrieu has decided to try and better this record, and with this end in view has taken up her quarters at Etampes, where she is daily practising.



"Valkyrie II," the three-seater machine, during one of its long flights at the London Aerodrome on Sunday week, referred to in last week's FLIGHT.

AEROPLANE SILHOUETTES FROM THE PARIS SHOW.

THE GOUPY BIPLANE.

FRENCH-BUILT biplane, with elevators on main planes and tail planes. Planes double-surfaced throughout. The upper planes are placed slightly further forward than the lower.

General dimensions.—Bearing surface, 22 square metres; length overall, 7 metres; width, 6 metres.

Seating capacity.—If two-seater, one behind the other.

Engine.—Gnome air-cooled rotary; 7 cylinders, of 50-h.p. Propeller and motor, to which it is bolted, are placed in front of the main planes. Any engine is fitted, according to personal desire.

Propeller.—To choice. Chauviere frequently used. 2.50 metres diameter, 1.25 metres pitch; normal revolutions, 800.

Wheels and skids.—Two wheels mounted in somewhat similar fashion to the well-known Blériot type. Two short skids, curving upwards towards the front, are placed before the wheels.

Tail.—Biplane tail with single rudder placed centrally behind the two planes. Elevators are attached to the outside edges of both planes, and work in conjunction with those on the main planes. On some machines a fixed empennage is fitted in front of the tail.

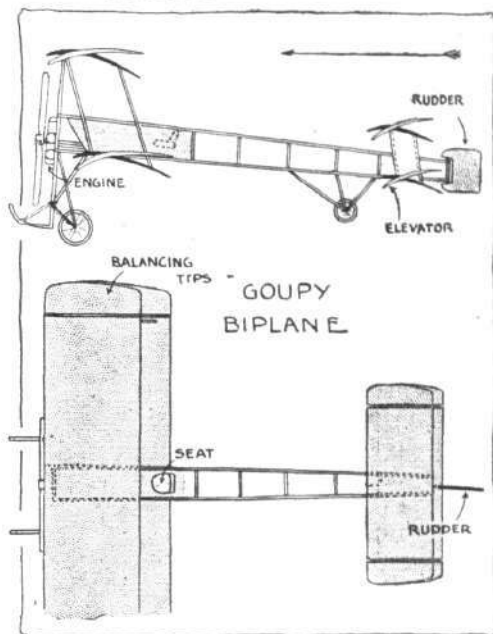
Lateral stability.—By tips fitted to the outside edges of both upper and lower main planes. Both sets work simultaneously. If the machine is falling to the right, the right tips are raised and the left tips depressed to regain balance, and *vice versa*. Similarly the tail planes have tips, which, however, only act as elevators, but in unison with those on the main planes.

Weight.—With Gnome motor, 250 kilograms.

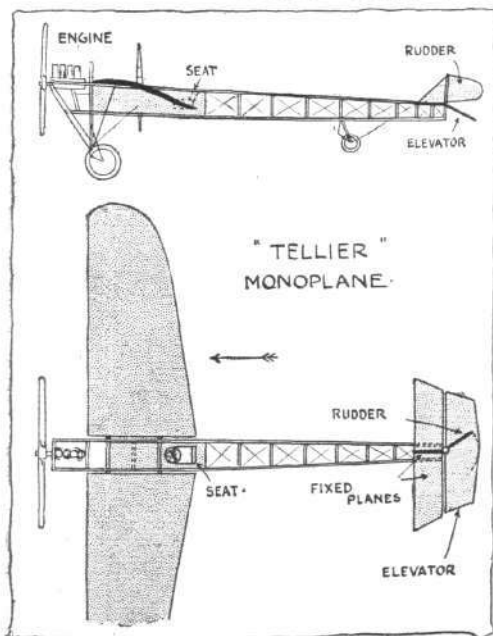
Speed.—70 to 85 kiloms. an hour.

System of control.—By means of a wheel mounted on a column in front of the pilot. Rotation of the wheel to the right or left steers the machine in those directions. A movement of the entire column to the right raises the left wing-tips, and a movement to the left the right tips. A backward movement of the column raises the tips on the main planes, and depresses those on the tail, thus effecting elevation. A forward movement has the reverse effect.

Price.—Without motor or propeller, 12,000 frs. With 50-h.p. Gnome motor and propeller of any known make, 25,000 frs.



THE TELLIER MONOPLANE.



BUILT by the famous French boat-building firm. Planes double-surfaced throughout. Of excellent finish. M. Emile Dubonnet, whose name will always be associated with the early successes of the Tellier, won on his first cross-country flight a prize offered by *Nature* for a 100-kilom. flight from town to town. The day following he flew from the aerodrome of Juvisy across Paris to Bagatelle.

General dimensions.—Bearing surface, 24 square metres; length overall, 11.85 metres; width, 11.85 metres.

Seating capacity.—One or two-seater. The machine described is a single-seater.

Engine.—35-h.p. Panhard, water-cooled, 4-cyl. vertical. Steel cylinders, copper water-jackets. Bore, 110 mm.; stroke, 140 mm. Weight, 100 kilograms. Revolutions, 1,000. Petrol consumption at normal revolutions, 14 litres an hour. Silencer is fitted if required.

Propeller.—Tellier, 1,000 revs.

Landing chassis.—Two wheels, mounted with springs in front, with a small wheel placed in front of the tail. The two front wheels are so arranged that they adapt themselves to any unevenness in the ground on which the machine lands.

Tail.—Fixed non-lifting tail-plane with fixed vertical fin over it. Elevating-plane fixed to the trailing edge of tail-plane. Single rudder fixed centrally above.

Lateral stability.—By flexing the trailing edges of the main planes.

Weight.—Complete with motor, 400 kilograms.

Speed.—About 85 kiloms. an hour.

System of control.—By steering-wheel mounted on a column in front of the pilot. A rotary movement of the wheel controls the rudder. A sideways movement of the entire column to the right or left flexes the left or right wing. A forward movement depresses the machine, and a backward movement elevates.

Price.—With 35-h.p. 4-cyl. Panhard engine, 25,000 francs.

A large two-seated model, known as the "Type Militaire," and fitted with a 50-h.p. 6-cyl. vertical Panhard engine is also built.

ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS.

Welcome to C. Grahame-White.

MR. C. GRAHAME-WHITE arrives from New York on Monday next, and the Committee has decided to give him an impromptu banquet to celebrate his victory in the Gordon-Bennett Aviation Race.

The banquet will take place at the Carlton Hotel, London, S.W., on Wednesday, December 7th, 1910, at 7.30 for 8 o'clock. Tickets 27s. 6d. each (inclusive of wines).

In order to facilitate the arrangements, members are requested to notify the Secretary as early as possible if it is their intention to be present, and to forward 27s. 6d. to cover the cost of the ticket.

Committee Meeting.

A meeting of the Committee was held on Tuesday, the 29th November, when there were present:—Mr. R. W. Wallace, K.C. (in the Chair), Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Major C. de W. Crookshank, R.E., Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. C. F. Pollock, Mr. Stanley Spooner, and Harold E. Perrin, Secretary.

Aviators' Certificates.—The following Aviators' Certificates were granted:—

35. Robert C. Fenwick. 36. Capt. A. G. Board. 37. Capt. H. F. Wood. **British Records.**—The Committee accepted the following British records made by Mr. T. Sopwith at Brooklands on November 26th, 1910:—

Duration ... 3 hrs. 12 mins. 40 secs.
Distance on all-British machine (Howard Wright)... 107½ miles.

British Empire Michelin Cup.

Mr. T. Sopwith on November 26th made a flight of 107½ miles at Brooklands Track in connection with the above competition. The flight was observed by the officials of the Royal Aero Club, and he course was measured by Messrs. Ewhank and Co., Surveyors, of Veybridge. This is the longest distance so far recorded in the competition, which for this year closes on December 31st, 1910.

The Club's Offer to the Admiralty.

The Committee of the Royal Aero Club has placed two aeroplanes at the disposal of the Admiralty for the use of Naval Officers at Sheerness and Chatham, at the Club's flying grounds at Eastchurch, Isle of Sheppey. The machines are biplanes, fitted with Gnome motors. Several members have promised to assist in giving practical instruction to the officers.

Baron de Forest £4,000 Prize.

The entries for the Baron de Forest Prize closed on November 30th. Altogether fifty-seven entries have been made.

PROGRESS OF FLIGHT

Aeronautical Soc. of Great Britain (53, VICTORIA ST., S.W.).

A GENERAL meeting will be held at the Royal Society of Arts, John Street, Adelphi, at 8 p.m., on Tuesday, December 6th, when Mr. W. H. Dines, F.R.S. (late President of the Royal Meteorological Society), will deliver a lecture on "The Practical Application of Meteorology to Aeronautics."

An informal meeting will be held at the Society's offices on Friday, December 9th, at 8.30 p.m.

Sheffield & District Ae.C. (22, MOUNT PLEASANT RD., SHARROW)

THE first annual general meeting of the club was held on Tuesday, November 15th, when Mr. A. V. Kavanagh presided over a good attendance. The secretary, Mr. C. Wightman, in the opening remarks of his report, related how his efforts to form a club in Sheffield were unsuccessful at first, but these difficulties were eventually overcome and the club was now in quite a respectable position, boasting 100 members. The secretary's report being adopted, he was accorded a very hearty vote of thanks.

The statement of accounts drawn up by the treasurer (Mr. H. M. Pashley) showed the club to be financially sound, in spite of several heavy first year expenses.

Owing to failing health the chairman did not seek re-election, at which much regret was expressed. The secretary and treasurer also gave reasons for resigning office, but on being pressed promised to give the matter further consideration.

The following gentlemen were elected on the committee:—Messrs. Kavanagh, Wightman, Pashley, Greenwood, Marshall, Richardson, Swindells, Rimmer, Boulden, Price, Dawe, Allott, Payne, Beart, and Frost. The first nine served on the committee last year.

Dr. Ripper, of the Sheffield University, was elected honorary chairman.

A young enthusiastic member, Mr. Stacey, was elected librarian. The next general meeting will be held on Wednesday evening,

Particulars of Aeroplane.—Competitors who have not already sent in full particulars of their aeroplanes, are requested to do so forthwith. In view of the large number of entries, and the necessity of inspecting each machine before an attempt is made, competitors are asked to give early notice as to when and where such inspection can take place.

Attention is drawn to the following special regulations:—

SPECIAL REGULATIONS.

a. Competitors must have their machines ready for examination as soon as possible after sending in their entries. In the event of any alteration being made after the examination such alteration must be at once notified to the Secretary.

b. Competitors must, before starting, produce a certificate from the maker certifying that both machine and motor are of British manufacture in accordance with the rules.

c. The complete machine must be examined before the start and the competitor must give a written undertaking that such machine complies with the regulations.

d. Competitors will be required to pay the out-of-pocket expenses of officials in connection with the verification of the machine and the observing of the start. A deposit of £10 must be paid prior to the verification of the machine, and any balance after payment of the expenses will be refunded the competitor.

Official Observers.—The Committee of the Royal Aero Club will be glad to hear from members who can assist in observing the starts from the English coast. At present it appears that Dover and Folkestone will be the most likely starting places.

The following letter has been received from Baron de Forest:—

"Spencer House, St. James', S.W.
"November 22nd, 1910.

"SIR,—In reply to your letter of the 16th inst., I certainly intend to present the prize myself. I will wait until it has been won, and then will fix the date of presentation.

"I am, Sir,
"Yours faithfully,
(Signed) "DE FOREST."

"Harold E. Perrin, Esq.,
"The Royal Aero Club."

Annual Dinner.

The Annual Dinner of the Royal Aero Club will take place early in January, 1911, and full particulars will be announced later.

HAROLD E. PERRIN,
Secretary.

166, Piccadilly.

ABOUT THE COUNTRY.

December 14th, at the workshops, 26, Paradise Street, at 8.30 p.m. A committee meeting will be held on December 6th, same place and time.

SCHOOL AERO CLUBS.

Arundel House School Ae.C. (15, ARLINGTON ROAD, SURBITON).

ON Saturday, the 26th ult., at the recently acquired aerodrome, the club duration record was broken by R. F. Mann, one of whose model monoplanes remained in the air for a period of approximately 50 seconds. The secretary, Mr. Robert P. Grimmer, will be pleased to hear from any model maker who has done better, as he is anxious to learn what is the best recorded performance of this nature.

Dudley House School Model Aero Club (LEE, S.E.).

A CLUB has been started in connection with this school for the purpose of studying the sport and science of aviation. Already some twenty boys are constructing models with a view to competing for a cup presented by an old boy, Mr. D. Lavender. Arrangements are also being made for some competition meetings to be held in the early part of next year, and it is hoped to organise a series of minor contests with junior clubs around London.

Roan School Aero Club (EASTNEY STREET, GREENWICH).

THE inaugural meeting of the above club was held on November 25th, and a committee appointed to draw up rules and arrange for papers on interesting subjects.

The headmaster of the school, Mr. C. M. Ridger, M.A., has consented to be president; Mr. A. C. Horth, chairman of the Aero Models Association, vice-president; and Mr. W. J. Potter, M.A., treasurer.

The use of the school workshop during the mid-day interval has been granted to members of the club, and already several members are busily engaged in making models of their own design. Mr. J. H. Peckham is the hon. sec.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Ground, Eastchurch.

MR. MCCLEAN was out on Wednesday, the 23rd ult., in the forenoon on his new "Short" biplane, and flew in circles and figure eights for 35 minutes, finishing with a good *vol plané* from about 200 ft.

At 2.30 he brought the machine out again, and rising to about 400 ft. he flew around the ground in wide circles, the while giving a good exposition of gliding. This flight was of half an hour's duration. Upon landing he immediately took a passenger aboard, with whom he flew for 10 minutes around the grounds.

On Friday Mr. McClean was again out for just over half an hour, and was flying well.

About noon on Saturday Mr. McClean brought his machine out and gave a sound exhibition flight of about half an hour, turning and planing in excellent style. In the afternoon Mr. McClean and Mr. Grace started away together, both on "Short" biplanes. Upon leaving the grounds they headed for Sheerness, over which town they passed, Mr. Grace continuing on over the water a considerable distance towards Southend before turning in the direction of "home." Upon their return to the vicinity of the grounds, both aviators gave a brilliant exhibition, in the course of which Mr. Grace passed over Eastchurch village. He was then some 1,500 to 2,000 ft. up, and from this height he finished a really pretty flight with a brilliant *vol plané*. Mr. McClean also landed well from a good plane. Mr. Jezzi was flying well during Saturday afternoon, keeping a nice angle and showing a good turn of speed.

Brooklands Aerodrome.

BROOKLANDS has again distinguished itself. When Mr. Cody, flying his Cody biplane on Laffan's Plain, recently captured the all-British record for distance and duration—94 miles in 2 hrs. 24 mins.—the British airmen here determined to go one better. There were several aspirants to the honour, Mr. Sopwith, on the Howard Wright biplane, and Mr. Pixton, on the Avroplane, being warm favourites. The odds, however, were slightly against Mr. Pixton, as the magnetism of the sewage farm had to be discounted.

To Mr. Sopwith, the aviator, and to Messrs. Howard Wright, the builders, we have to extend our hearty congratulations on having put up on Saturday last a new all-British distance record of 107 miles, and at the same time established a British duration record of 3 hrs. 12 mins. for any type of machine, British or foreign, flown in this country.

Mr. Sopwith has also by the same flight achieved the best performance to date for the British Empire Michelin Cup. The Howard Wright machine on which these records were made is a biplane fitted with a 60-h.p. E.N.V. engine and Spiral tube radiator. It has a Farman type wheel-base, monoplane tail and elevator, with a central rudder above and below the tail plane. Mr. Sopwith first flew a Howard Wright monoplane—this was only some few weeks ago—and we drew attention in a previous issue to



Mr. Thomas Sopwith in the pilot's seat of his Howard Wright biplane, fitted with E.N.V. engine, after creating a new British record for distance and duration by his flight at Brooklands Aerodrome on Saturday of 107½ miles in 3h. 12m. 55s.

the rapid progress he made. He has only had delivery of the biplane a few days, which speaks well for the ease of control of this make of machine. This flight and triple record breaking naturally by comparison overshadows the smaller events of the week, although much good work has been put in by the other tenants.

Mr. Graham-Gilmour on Thursday last week piloted the Martin-Handasyde for straight flights at about 20 feet high. Mr. Collier rolled the Otazel, as did Mr. Oxley the Avroplane and Mr. Macfie his biplane.

The Bristol-Gnome, piloted by a pupil, made short flights, and Mr. Sopwith was out carrying passengers.

On Friday Mr. Low took up a passenger on the Bristol-Gnome, and Mr. Snowden-Smith made several circuits, at a good height, on M. Blondeau's Farman.

Mr. Sopwith, on the Howard-Wright, remained in the air for half an hour, and Mr. Pixton was flying the Avroplane. The Macfie and Otazel were seen rolling.

On Saturday all minor essays were eclipsed by Mr. Sopwith's



Mr. Sopwith, on his E.N.V. engined Howard Wright biplane, after his record flight.

performance, but Mr. Morisson, on his single-seated Gnome-Blériot, did remarkably well, rising quickly and at an acute angle. The Avro team, Messrs. Pixton, Oxley, Beattie and Jenkins, all did their utmost, and returned the machine home without a scratch. The Bristol-Gnome was also flying.

Sunday, mud, rain and wind kept shutters up, and people away. On Monday the Spencer-Stirling biplane, fitted with R.H. engine, made short flights. Mr. Sopwith, on his Howard Wright biplane, and Mr. Low, on the Bristol-Gnome, made several circuits, the latter with passengers, otherwise there was little done.

Mr. Oxley was the first out on Tuesday, the 29th ult., followed later by Mr. Pixton on the same machine. The latter was flying off and on for the whole afternoon. He is a very daring and pretty flyer, but the sudden movements he makes must put a severe strain on the bodywork. In particular, one dive and sudden righting appeared to actually bend the body, and it speaks well for the work Mr. Roe has put into his fuselage that nothing serious happened. We do not wish to appear pessimistic, but if Mr. Pixton continues his progress on his present lines we doubt whether he will get through life unaimed, and the science may lose the fine work which so promising an airman can put in.

The outstanding event of the day was Lieut. Snowden Smith's flight to Aldershot and back on the Farman biplane belonging to Mrs. Maurice Hewlett and M. Blondeau. This is referred to on p. 995.

Mr. Low contributed his quota by *vol planés* from about 200 ft., and carrying passengers on the Bristol-Gnome. Mr. Sopwith, resting on his laurels, gave pleasure or otherwise by carrying passengers of both sexes.

Mr. Fisher and Mr. Raynham, on "Neale VI," made hops and short straight flights, as did also the Spencer-Stirling biplane.

M. Blondeau was passenger carrying, and at one time attained a good altitude.

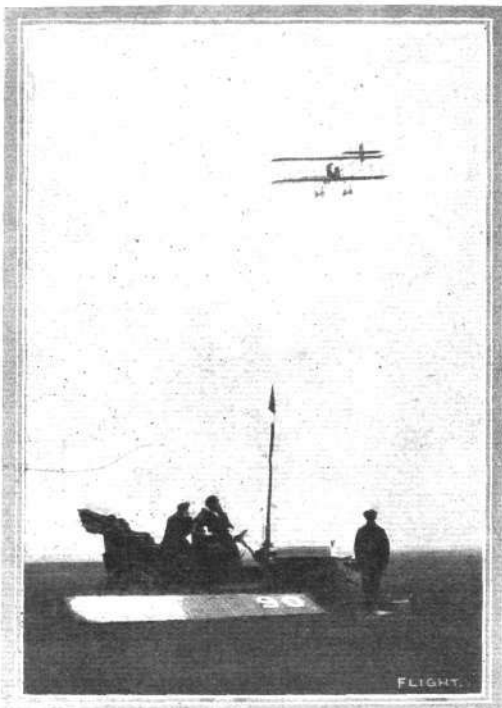
The London Aerodrome.

CAPTAIN BOARD and Mr. Bouwens, pupils of the Blériot school, were out on and off all day on Tuesday last week, whilst M. Prier went up on an Anzani-Blériot for a short flight in the afternoon.

Wednesday proved too rough for flying. "Valkyrie III," on Thursday, was out in the morning, but as the wind was dangerously gusty the pilot decided to return to his shed. In the afternoon M. Prier (instructor of the Blériot School) went out for a short flight in an Anzani-Blériot, and made what looked like an extremely rough passage, owing to the wind being very treacherous. Mr. Hynes, a new Blériot pupil, took his first lesson in rolling.



Mr. Sopwith takes up his sister, Miss May Sopwith, for a flight at Brooklands on his Howard Wright machine.



BRITISH RECORD FLIGHT.—Mr. Thomas Sopwith, on his Howard Wright biplane, completing his 90th mile at Brooklands. Note the score board which conveyed to the flyer, mile by mile, his distance traversed.

Rough weather stopped all air work again on Friday, but on Saturday the Aeronautical Syndicate's "Valkyrie II," the passenger carrier, was out, and in spite of the fog carried at different times six passengers, including Messrs. Clutterbuck, Curran, Bouwens, Wickham, Benson, and a lady, who all expressed their great delight in the steady flying of the machine, the latter deciding to enter for her apprenticeship. This machine made in all some 30 circuits of the ground, about 60 miles, at altitudes ranging from 100 to 200 ft. It was not possible to attain any greater height owing to the density of the fog, as at a height of 200 feet the ground was only just discernible. Mr. Bonsor (a pupil) was also out practising on "Valkyrie III." Great activity was noticeable in the Blériot School, as Captain Board and Mr. Bouwens were having their final practice before going for their certificates in the afternoon; Mr. Hynes and Mr. Johnstone were also practising and showed improvement.

In the afternoon Captain Board was successful in his effort to get his pilot's certificate, but Mr. Bouwens had the misfortune to be unable to compete owing to the somewhat belated arrival of the official observer, which did not leave sufficient daylight after Captain Board had finished.

"Valkyrie IV," fitted with a 30-35-h.p. Green engine, it is anticipated will be ready for its maiden flight by this week end.

Salisbury Plain.

THERE was a very sharp frost on Sunday morning, but at a quarter past ten Lieut. Cammell, R.E., brought out his "Blériot XII," fitted with an E.N.V. engine, and although the cold weather made the engine a little difficult to start, the monoplane was in the air at twenty minutes to eleven, and made eight complete circuits of about 4 miles circumference, in 35 minutes. He then landed because of a broken wire, but this was quickly repaired, and at a quarter past twelve he was again aloft. He completed one circuit of the ground in 3 minutes, and then started off at a height of 1,000 ft. for Aldershot. He was, however, forced to land at North Waltham owing to strong winds, but hoped to get on to Aldershot later. Soon after Lieut. Cammell had left, Tetard was out on the Bristol biplane and flew around Amesbury and Durrington at a height of 300 ft.

BRITISH NOTES OF THE WEEK.



Mr. Pixton, on an Avro triplane, making a fine high flight at Brooklands this week.

Mr. Sopwith's New British Record.

THE very fine new British records set up by Mr. Thomas Sopwith on Saturday last at Brooklands, when he covered 107½ miles in 3 hrs. 12 mins., will be found referred to in detail in the doings at Brooklands reported on page 993.

From Brooklands to Aldershot and Back.

A NOTABLE achievement was effected by Lieut. Snowden Smith, who recently obtained his pilot's certificate at Brooklands, when on Tuesday morning he flew from Brooklands to Aldershot, and, after taking breakfast there with some fellow officers, successfully made the return journey by the *route aerienn*e. Mounting the Hewlett and Blondeau School Farman biplane, on which he has recently been taught by M. Blondeau, Mr. Smith rose from the Brooklands Ground at about half-past eight in the morning, and following the London and South-Western Railway made straight for Aldershot, 28 miles away, where, after circling above the barracks several times, he landed on the Queen's Parade. After breakfast he again mounted his machine, and flew back to Brooklands, arriving there about 11 o'clock, the journey each way taking about half-an-hour. At the conclusion of his flight the aviator was very cold, and said that the mist had seemed like a bank before him. As he rose higher he found he was entirely out of it, and then he only came down to find his way.

Flying Across the Mersey.

USING his new biplane, Mr. C. Paterson, accompanied by one of his pupils, Mr. R. King, on Monday, succeeded in flying across the Mersey. He ascended from the Freshfield Aerodrome, and, rising to a height of 500 ft., flew across to Hoylake, and descended there less than half an hour later. He only waited there a short time, and then successfully made the return journey to Freshfield, passing over New Brighton en route.

Mr. Cody Loses Some Petrol.

ON Saturday, November 26th, Mr. S. F. Cody again had a very narrow escape. After a flight of about five miles, carrying 20 gals. of petrol and over 7 gals. of lubricating oil, at a height of 450-550 ft., Mr. Cody descended at the Army Balloon Factory at Farnborough, where he took up Lieut. Reynolds as a passenger for an 18 minute cross-country flight. At the end of this time, Mr. Reynolds called the aviator's attention to one of the petrol

tanks. The seam had given way, and the spirit was spurting all over the carburettor side of the engine and saturating the lower plane. Mr. Cody immediately shut off the power and glided down to Long Valley from a height of 300 ft., where he transferred the petrol into the second tank. He then flew back to his shed.

Baron de Forest Prize.

ACTIVE preparations are now in progress for various attempts which will be made by British aviators during this month to win the Baron de Forest prize of £4,000. The different competitors are at liberty to, and propose starting from various points, Mr. Loraine from Dover, where Mr. Colmore and Mr. McClean also propose to start from, Mr. Cody from Farnborough, Mr. Sopwith from Eastchurch, and Lieut. Watkin from Shorncliffe. The last mentioned will use Capt. Maitland's Howard Wright biplane, with which he has been making several highly satisfactory trials at Shorncliffe. The machine is fitted with special compass, and with a wireless telegraphy apparatus, and by this latter means Lieut. Watkins hopes to be able to keep in touch with Capt. Maitland, who will follow the flight on a tug.

Farman Biplane Delivered to British Government.

IN the presence of Capt. Burke, the Henry Farman biplane purchased by the British Government was put through its final tests on Saturday at Chalons Camp, and duly handed over. Louis Dufour, a Farman pilot, carried Capt. Burke for a couple of flights, after which Henry Farman took the helm, and accompanied by Mr. Holt Thomas as passenger, made an exhibition trip, flying very high, and rising and dipping to demonstrate the controllability of the machine. This biplane, which is distinguished by its nickel-plated fittings, passed through all its tests satisfactorily, the final flight, by Dufour and Capt. Burke, ending with a splendid glide.

Tests with the British Army Paulhan Machine.

SEVERAL very good trial flights have been made recently by the Paulhan biplane purchased by the British Government. On Saturday last Gaillé twice made cross-country trips from St. Cyr to Buc and back, while later in the day he carried out a series of altitude tests.



Mr. Thomas Sopwith, the distance and duration record flyer for Britain, and his pet mascot bear "Poley."

The Maurice Farman Machine.

SEVERAL of our readers having enquired as to the arrangement of the skids on the Maurice Farman biplane, we wish to point out that the sketches given in our issue of November 10th were correct, while several drawings which have since appeared in other quarters are incorrect, they showing the old arrangement of skids which Mr. Farman has abandoned in preference to the one illustrated in these pages.

S.M.M.T. and Aeroplanes.

ONE of the subjects which has been engaging the attention of the Aero Section Committee of the Society of Motor Manufacturers and Traders lately is the rates charged by railways for conveyance of flying machines. A sub-committee, consisting of Col. Mulliner, Mr. H. V. Roe, and Mr. J. E. Hutton, has been appointed to consider the matter with a view to approaching the railway companies.

Another subject which is being considered is the liability of an aviator in certain cases, and draft forms are being drawn up to meet the various cases.

The Wright Brothers and Grahame-White.

A CABLEGRAM from New York announces that papers have been served upon Mr. Claude Grahame-White in connection with an action brought by the Wright Bros. in the United States Circuit Court for an alleged infringement of their patents. The Wright Bros. ask for an injunction against Mr. White and also claim damages.

Aviation at Huntingdon.

STRENUOUS efforts are being made locally at Huntingdon to make Portholme an important aviation centre, as it is claimed that the ground is one of the finest sites for the purpose. Several influential public men of the district, headed by the Mayor, are interesting themselves in the movement, and the proposal has been well received at some meetings recently held. It is proposed to float a small company, and invite local people to take up the shares.

An Aerodrome Wanted at Dewsbury.

MR. TURNER, the well-known motorist of Dewsbury, after giving some considerable attention to aviation in France, has returned to Dewsbury and is anxious to establish an aviation centre

there, to which end he is endeavouring to find a suitable flying ground in the neighbourhood.

Humbers and Aeroplanes.

AT the annual meeting of Humber, Ltd., held last week, the Chairman, Earl Russell, was emphatic in his remarks as to the far-sightedness of the directors in entering early into the flight industry. Their view was that the business of Humber, Ltd., should be in the forefront of whatever was going on. Possessing a factory as capable as any in this country, or in France, of turning out satisfactory aeroplanes, the board thought they ought to go in for the business. They had signed an extremely favourable contract for an exhibition in India, and they had reason to hope that trade would be opened up with India as a result. A demand for aeroplanes did exist, and it was possible to sell them at a good price. Should this department develop quickly to justify it, the directors proposed forming a separate Company.

Those "Catch-Line" Headings.

MR. DREXEL's latest achievement should indeed take a bit of beating, according to a "heading" in the *Bath Daily Chronicle*, which puts it at "5½ miles high" at Philadelphia last week. Curiously enough, the paragraph only mentions that the official height was 9,970 ft., and does not explain what became of the remaining two-thirds of that record flight. Perhaps Drexel will be able to tell us.

A New Aviator!

IT was rather interesting to read on Monday morning that "Mr. Sopaitte" flew at Brooklands on Saturday for 3 hrs. 12 mins., &c., and some may have wondered who this clever foreigner was, and tried to "place" him by his name. It was, however, only a morning contemporary's new way of spelling Mr. Thomas Sopwith's cognomen.

Getting near the Arabian Nights.

"FLYING CHAIRS" is the title of a new company just registered. Evidently aviation is forcing its way even more rapidly than we could ever have hoped for. If this is followed by "Flying Tables," "Flying Sideboards," and other such bric-a-brac, we shall hardly be equal to the task of advocating no liability for the users. The line, we think, will have to be drawn at "Flying Carpets."

FOREIGN AVIATION NEWS.

A Record by the R.E.P.

A NOTABLE performance was accomplished at Buc on Sunday by Laurens when he took out the new R.E.P. two-seater for its first trial. Accompanied by his young wife, Laurens flew for two minutes over the hour, during which time he set up new passenger speed records for distances up to 80 kiloms., and covering 79 kiloms. in the hour. For the sake of comparison we reproduce below the old figures and the new, from which it will be seen that the improvement is a very decided one. Both Laurens and his wife are to be congratulated on this result, especially as the cold and mist made their experience a very trying one.

Old Records.

10 kils.	Ladougne	h. m. s.
20 "	Aubrun	0 8 14
30 "	"	0 19 39
40 "	"	0 29 10
50 "	"	0 38 51
60 "	"	0 48 28
70 "	"	0 57 58
80 "	"	1 7 31
	"	1 16 59

New Records.

10 kils.	Laurens	h. m. s.
20 "	"	0 7 44
30 "	"	0 15 39
40 "	"	0 23 22
50 "	"	0 31 9
60 "	"	0 38 47
70 "	"	0 46 23
80 "	"	0 54 1
	"	1 1 55

26th ult., when Lieut. Delage, accompanied by Lieut. Maillols, left Etampes and flew to La Chausse-St. Victor, just by Blois, and back again. During the journey, which was of a duration of 3 hrs. 22 mins., a distance of 210 kiloms. (130 miles) was traversed.

Progress at the Goupy School.

THE number of pilots who are experts on Goupy biplanes is rapidly mounting up, and last week saw three more qualified at Juvisy. These were M. Wintrebert, M. Bobba, and Lieut. D'Aiguillon, who carried out their trials in anything but favourable weather, after only a short period of tuition. The Goupy school at Juvisy, which is under the charge of M. Marquely, are very proud of the fact that although one or two of their pupils have had tumbles due to their inexperience, there has been no serious accident.

The Blériot School at Pau.

THE Blériot School at Pau is now in working order, and the last week has seen a number of pupils very busy there. On Saturday morning last M. Blériot arrived with Leblanc, and they set to work at once testing a new type of stability device fitted to one of the *Circuit de l'Est* Blériots. On the following day Mons. Blériot, on a two-seated monoplane with a 50-h.p. engine, mounted to a height of 200 metres and flew over Pau for some time, a performance which was duplicated later in the day by Leblanc. On Monday M. Blériot took his wife for three circuits of the ground at Pau on a two-seated Blériot, which is now designated Type 14.

Two Belgian Prizes.

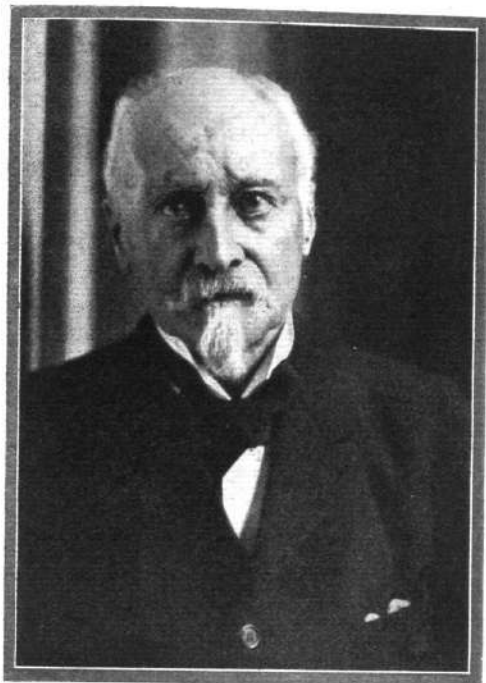
THE conditions have now been decided upon for the prize of £800 offered by the Belgian Aero Club. It will be given to the aviator who, before August 1st next year, makes the longest flight on an aeroplane fitted with a Belgian engine. The same club has also offered a prize of £200 for the first aviator who makes a flight of 100 kiloms. on an aeroplane built in Belgium and fitted with a Belgian-built motor.

Henry Farman at Etampes.

BY the aid of a couple of motor cars, Mr. Henry Farman transferred from his works at Mourmelon to Etampes, on Sunday afternoon, the new machine on which he proposes to try to beat the world's duration record and retain the Coupe Michelin. On one car was the central portion of the biplane, including the chassis, with the motor and propeller and tail planes, while on the second car was the extension of the main planes and other parts.

French Officers and the Lazare Weiller Prize.

SEVERAL French officers have intimated their intention to try for the Lazare Weiller prize, and the first attempt was made on the



The late Octave Chanute, the great aeronautical scientist, who passed away at Chicago last week at the age of 78.

Sommer Busy at Douzy.

ON Saturday afternoon M. Sommer was very busy testing two of his biplanes, and also had his monoplane out. A fairly stiff breeze was blowing, but in spite of this M. Sommer four times flew from Douzy to Mouzon and back.

Gaubert at Villacoublay.

ON Saturday afternoon Gaubert, on a French-built Wright, made several good flights from the aerodrome at Villacoublay. In one he flew over the wood at Clamart, and in another he passed over the Military Aerostatic Park at Chalais Meudon at a height of 600 metres. On the 23rd ult. he was flying for an hour, during which he made an excursion to Chatillon and Fontenay, returning over Saclay, Bievres, and Petit-Bicetre. Stopping his motor at a height of 600 metres, he then slowly glided down and landed just in front of his hangar.

A Good Cross-Country Flight by Breguet.

ACCOMPANIED by Lieut. Ludman, M. Breguet made a splendid flight on the 23rd ult. Starting from his ground just by Douai, he rose to a height of 800 metres, crossed the town, and then completed a circuit, the points of which were Vitry, Lambres, Douai, Dorignies, and Quincy.

French Government and Aeroplanes.

IN approving the credit of 1,800,000 francs asked for by the Government in connection with the proposed military aeroplane competition, the French Parliamentary Budget Committee have expressed the view that the winning aeroplane should be tested in the south of Algeria, with a view to their being used for postal work in that district and across the Sahara.

French Colonies and Aviation.

THE Ligue Nationale Aérienne is making strenuous endeavours to induce the French Government to make a definite move with regard to the employment of aeroplanes in the Colonies. A deputation from the Ligue was received by the group of members of the Chamber of Deputies specially interested in aeronautics and a scheme laid before them calling upon the Government to provide a sum of £4,000 this year and £6,000 next year.

Accidents to Flyers.

IN the course of a lecture in Paris the other day M. Soreau said that taking all countries the number of licensed pilots was about 500; the Ae.C.F. alone have issued 271 certificates, and the percentage of persons killed while engaged in flying was only six. M. Soreau pointed out that in order to estimate the risks the distances covered must be taken into account, and taking the reasonable aggregate of 125,000 miles for all the aeroplanes in the world, it worked out to one fatal accident for 4,375 miles. This figure included accidents with experimental machines.

Trials of Motors in France.

THE principal conditions governing the trials of motors for aeroplanes which has been organised by the Ligue Nationale Aérienne are announced. The prizes will amount to 20,000 francs, and there will be three classes: I, for motors up to 35-h.p., II, those between 35 and 70-h.p., and III, those above 70-h.p. In each class there will be a first prize of 5,000 francs, and the classification will be according to weight per horse-power. There will also be a supplementary prize of 5,000 francs for the motor which makes the best showing of weight per horse-power irrespective of class. The trials will consist of two runs of five hours each at full load on consecutive days.

Mdlle. Dutrieu and her Certificate.

AT the last meeting of the Aviation Committee of the Aero Club of France it was decided to ask the Aero Club of Belgium for permission to grant the Ae.C.F. pilot certificate to Mdlle. Helene Dutrieu, who, as we recorded in our last issue, qualified at Etampes recently. The Belgian Aero Club have already given their certificate to Mdlle. Dutrieu.

Trials with the Zens Monoplane.

SOME satisfactory trials were made at Coulommiers on Monday with a monoplane designed by M. Paul Zens. Piloted by Niel the machine flew several times in spite of a strong wind, and once carried a passenger. In running order the machine weighs 500 kilograms, and it is fitted with a 35-h.p. Gregoire-Gyp engine. A new monoplane is being built by M. Zens to take part in the military trial.

Orville Wright at Berlin.

MR. ORVILLE WRIGHT paid a visit to Johannisthal on the morning of the 25th ult., and made a short flight with Thelen, going round the course twice. He also was an interested observer of a German officer trying for his pilot's certificate. In his excitement, however, the officer failed to pull up in the requisite distance and ran his machine into the railings, with the result that it was somewhat damaged, while the would-be pilot sustained a few bruises.



Prince Henry of Prussia in his aviator's dress, after qualifying for his pilot's certificate at Frankfurt on the Euler biplane. Reading from left to right are: Prince Henry, von Hammacker, von Hiddessen, and August Euler, the Prince's instructor.



M. Caillé, the first pilot to fly the new Paulhan biplane.

Serious Accident to an Italian Inventor.

WHILE testing, at Milan, a new monoplane which he had designed and built, Count Gannonieri met with an accident which it is expected will prove fatal. Several satisfactory flights had been made, and during the last the fore part of the machine suddenly dipped, with the result that the machine fell to the ground. It was smashed to pieces, and it is feared that the Count will not recover from the serious injuries he sustained.

Gibert at Caussade.

ALTHOUGH it rained almost continuously a large crowd gathered at Caussade on Sunday to see Gibert fly on his monoplane, and in order not to disappoint them he made a trip of four kiloms. On Monday afternoon he flew for a distance of 20 kiloms. across country, thereby securing the prize offered by the Municipal Council.



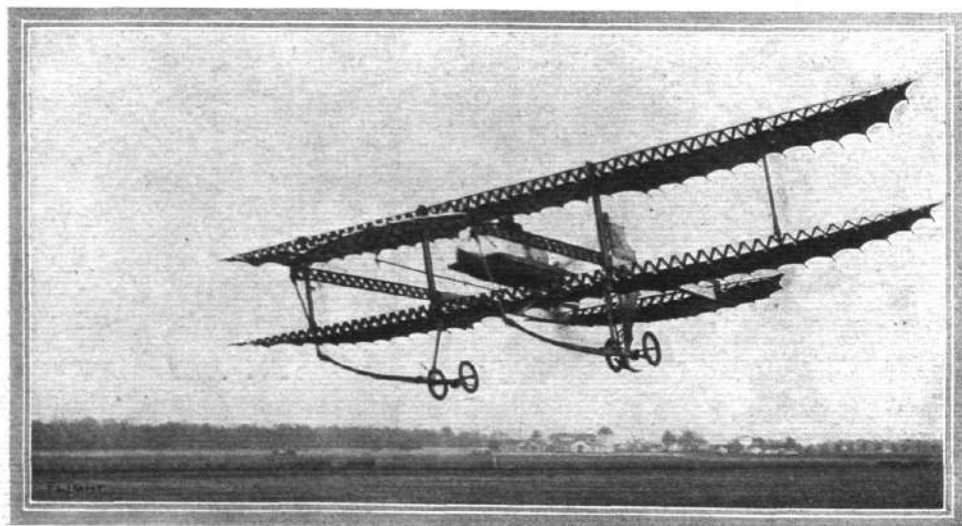
Mdle. Marvingt at the wheel of the Antoinette monoplane upon which she made a new record for a woman at Mourmelon, by flying 30 miles in 53 minutes, incidentally qualifying for her pilot's certificate.

Another Aviator named Kinet.

UNDETERRED by the tragic death of his brother, Nicholas Kinet, some time ago, Louis Kinet is assiduously practising flying at the Belgian aerodrome at Kiewit. On Sunday last he had a fall, but fortunately without serious results either to himself or his machine.

Drexel's Height Record Reduced.

DURING a flight which lasted for 2 hrs. 10 mins. at the Point Breeze Track, Philadelphia, on the 23rd ult., Mr. J. A. Drexel went up to a height which was at first given as 9,970 ft., thus beating Johnstone's world's record of 9,714 ft. Subsequently, however, the President of the Aero Club of America stated that the official reading of the barograph was 9,450 ft., so that Johnstone's record still stands. Mr. Drexel used his Blériot monoplane, the wings of which are covered with "Continental" aeroplane fabric.



Paulhan biplane flying well at St. Cyr.

THE PROBLEM OF THE HELICOPTER.

(Concluded from page 978.)

At this point, in order to avoid misunderstanding in the treatment of a subject that has infinite possibilities of confusion, we take the opportunity of recapitulating the gist of our preceding arguments in order that they may stand out clear and distinct from those that follow. Thus far we have dealt exclusively with that aspect of the problem presented by what may be termed the "disc area theory." This theory assumes the propeller to be a device for the purpose of creating and maintaining a uniform slip stream velocity throughout its entire disc area, and it assesses the merit of practical results obtained from actual screws by equating them to this theoretical basis on the grounds that the basis in question represents the highest possible degree of efficiency. By efficiency is meant the ratio of power to static thrust, and we would again emphasise that this particular article is entirely confined to an investigation of the theory of the efficiency of static thrust screws as thus understood. This ratio is not a true ratio in the scientific sense, for its factors have different dimensions, thrust and power being equations of different degree. But, like the disc area theory itself, it is a point of view very commonly adopted in practice, and if only for that reason would have to be taken into account.

This brings us to a point at which we can turn our attention to another aspect of the theory of the screw that we wish to put forward in this article. It must be obvious that the blade of a propeller is only energising a small portion of slip stream at any given instant of time, and let the revolutions be as high as they may, nevertheless each individual blade will still be incapable of operating upon the whole of the disc area simultaneously. On first thoughts, this would appear to be an argument completely opposed to the disc area theory, and in principle it is, of course, quite different, but there are practical considerations that cause the disc area theory to present an eminently useful point of view, and one of its useful purposes is to indicate the possibility of limitations in any theory that is solely concerned with the independent action of each blade separately. It is, at any rate, plausible that the disturbance over the disc area, which occupies a fixed position in space, may ultimately attain to such an approximately uniform value as to render any further increase in the number of blades or revolutions to be a highly inefficient means of attaining increased effect. It is, therefore, the fact that the disc area constitutes a limited field of operations that justifies the fundamental theory based thereon, and also renders it necessary to bear in mind the possible limitation of applying what is commonly termed the "aeroplane analogy" to the case of the static thrust screw.

In principle, it is obviously proper to regard the blade of a screw as an aeroplane, and it is extremely interesting to compare this aspect of the problem presented by the helicopter with the corresponding aspect of the problem presented by the aeroplane. Thus, if we regard the blade of a propeller as an aeroplane and argue on the premises founded by our recent articles entitled "Can we fly faster for less power?" we find that so far as each blade is concerned, the condition of least resistance, that is to say least thrust per unit of load, obtains when the power expended on skin friction is equal to the power expended on load and that for the stated coefficient of skin friction ($0.00018V^2$) the angle of least resistance is 5° . Converting this into the terminology of a propeller we must consider the thrust applied to the blade as a function of the torque applied to the shaft, while the load supported by the blade becomes the thrust of the screw. By this analogy, we may say that the least torque per unit of thrust obtains when the work done on skin friction is equal to the energy in the slip stream.

The torque in question must, of course, be considered as a value expressed in pounds applied with a certain leverage from the axis of rotation representing a suitable mean value of the blade radius. On this assumption the equation of pounds torque to pounds thrust becomes a direct measure of efficiency, inasmuch as the numerator and the denominator of the fraction represented by the ratio are both of the same dimensions, whereas the ordinary method of equating pounds thrust to horse-power in the shaft is not a true measure of efficiency at all, for the dimensions of the two factors in the ratio are not of the same degree.

It is, however, obvious that the idea of efficiency in connection with a helicopter is unquestionably associated with the ratio of thrust to horse-power, and the situation thus presented leads to one or two other very interesting considerations, in which this discrepancy between the dimensions of the factors thus equated becomes the keynote. In all the foregoing deductions as to what is most efficient in the design of a helicopter it will be found that the inevitable conclusion is always the same, and may be summed up in the words "go slow." The advantage of a large diameter is due to the fact that it reduces the velocity of flight on the part of the blade by reducing the revolutions for a given thrust. These deductions are precisely the same as were arrived at in the

above mentioned article on the aeroplane, where, it will be remembered, one of the most important conclusions was that for a given effective angle the thrust required per unit of load supported remained independent of velocity, consequently the power required per unit of load supported varies directly as the flight speed. Applying this theory to the propeller blade we may say that for a given effective angle the torque per unit of thrust is independent of revolutions and that the power per unit of thrust is therefore directly proportional to revolutions. The so-called static thrust efficiency of the screw, being an expression of the thrust per unit of power, is therefore inversely proportional to the revolutions for a given blade angle, which once again brings us to the same conclusion that everything must be done to enable the speed of the blades to be slow if we would have a high efficiency.

Varying the speed of flight with a constant angle causes a variation in the load theoretically proportional to the square of the speed, so that for a constant thrust from a fixed diameter with varying revolutions it is necessary to change the angle. It will be remembered, however, that the ratio of thrust per unit of load is dependent on angle although independent of velocity, consequently the torque for a given load will be greater whenever the angle is other than that of least resistance. Moreover, and this is the important point, the increment in question will more than neutralise any anticipated gain of efficiency, from the power-thrust point of view, resulting from reduced revolutions, supposing the angle to have been increased for the purpose of reducing the speed. It is, of course, true that increasing the angle will reduce the revolutions at which a given thrust will be produced, and were the ratio of torque to thrust constant for all angles, such decrease in speed would be a sheer gain in efficiency. This would lead to the use of the steepest effective blade angle when a given thrust was required from a given diameter*—a result that is distinctly opposed to the theory of least resistance, and the analogy between the aeroplane and propeller blade. In this connection the important point to bear in mind is that the thrust is proportional to the square of the revolutions, and only directly proportional to the tangent of the angle; when the angle is increased the reduction in speed required to maintain the same load is, therefore, comparatively small, and the increment in torque thrust ratio neutralises its advantage.

The mathematics of this point involves a comparison of the formulae for lift and thrust of aeroplanes. The formula for lift is

$$P = \frac{V^2 \tan \beta}{200}$$

whence

$$V = \sqrt{\frac{200 P \tan \beta}{\tan \beta}}$$

so that if the lift remains constant with an increasing angle the flight speed is reduced:—

$$V \propto \frac{1}{\sqrt{x}} \tan \beta$$

where x is the multiple representing the increment of the angle.

The ratio of thrust per unit of load is given by the expression:—

$$\frac{T}{P} = \frac{\tan^2 \beta + 0.0072}{2 \tan \beta}$$

which has a minimum value = $\tan \beta$, and is of such an order that any increment of $\tan \beta$ above the value of least resistance (where $\beta = 5^\circ$) produces a ratio:—

$$\frac{T}{P} > \sqrt{x} \tan \beta$$

where x is again the multiple increment of $\tan \beta$.

Now the power required to sustain the load is a product of thrust and speed, and as a comparison of the above expressions shows that for a given load supported by a variable angle the thrust increases in greater ratio than the reduction in speed, it follows that the net result is a loss when the angle is increased above its value of least resistance.

On the other hand, if this loss of efficiency is small over a small range of angles then a variable pitch screw should be capable of producing thrusts approximately directly proportional to the power applied to the shaft, provided always that the effective velocity of the slip-stream is not increased either by an increase in the angle or revolutions. If the velocity of slip-stream is increased, then the increment in thrust would only obey the law $(1/K)P$, as already explained in the first part of this article. We can thus see how the disc area theory and the aeroplane analogy are inter-connected. So long as the revolutions are low the blade may be capable of obeying aeroplane laws, but when the revolutions are high limiting values are imposed by disc area considerations.

* In the subheading of the first part of this article, this condition was inadvertently given as one of greatest efficiency.

The practical use of the term efficiency in its unscientific sense invariably leads to a very great deal of confusion, especially in connection with the mental estimate that is apt to be formed of the results of static thrust tests of screws, and it is in order to try and elucidate some of the less obvious aspects of such cases that we deal with the matter at this length. One of the most confusing issues, for example, is presented by the apparently logical deduction of a "true" efficiency from a comparison of two so-called efficiencies equating thrust to power. Thus, for example, suppose the thrust of a 10-ft. diameter propeller is 200 lbs. at 300 revolutions, and that the power actually in the propeller-shaft is, say, 10-h.p.; here is a so-called efficiency of 20 lbs. thrust per horse-power. Now suppose that we take the stated thrust and the stated diameter, and ascertain by the formula given in the list the velocity of slip-stream required to produce that thrust. From this velocity we can ascertain, from another formula there given, the thrust per unit of power, where the power is that actually manifest in the slip-stream itself. Suppose, for example, that, for the case in point, the velocity required is 33 ft. per sec., and that this represents an efficiency of 34 lbs. per h.p., then it is obvious that the slip-stream itself is consuming 6 h.p. of the 10 h.p. delivered to the shaft; in other words, the apparent "true" efficiency is 60 per cent. From the practical point of view, and considering solely the state of static thrust, this is an eminently proper way of looking at efficiency; but it is, nevertheless, apt to be misleading, especially when, as may quite well happen, an exceptionally high value of, say, 75 or 80 per cent., blinds the designer to any appreciation of a possibly better state of affairs.

It may seem paradoxical to suggest in the face of such results that a lower efficiency, calculated on the same basis, might actually represent a scientifically more efficient screw. When the conditions are such that a very large proportion of the total power goes in the creation of slip stream we may assume without error that the blade angle is comparatively steep and if it is steep we may argue with reason that in all probability it exceeds in value the angle of least resistance. Let us suppose for the moment that such is the case; the question arises, what will be the result of reducing the angle until it reaches that of minimum resistance? If the angle is reduced under these conditions and the speed of revolutions is maintained constant the total thrust will decrease in proportion to the tangent

of the angle and the total power will decrease in like proportion, but the efficiency represented by the ratio of thrust to power will increase until the angle of least resistance is reached. If for diameter and revolutions we write tip speed, the efficiencies of screws with effective 5° blades are shown graphically in Diagram 3.

Now the interesting point about this particular problem, which makes the whole subject so elusive, is that while the efficiency of thrust to power is increasing as the angle decreases, the apparent true efficiency represented by power converted into slip-stream is decreasing, and when the angle of least resistance is reached, only 50 per cent. of the power applied to the shaft will be converted into slip-stream energy. The other 50 per cent. of the power will be utilised in overcoming skin-friction. This particular value of 50 per cent., however, is true only on the assumption laid down in our aforementioned article on aeroplanes, to the effect that skin-friction varies as V^2 , in which case the angle of least resistance obtains when the power expended on skin-friction is equal to the power expended on load.

Summing up, therefore, it has been shown that the angle of least resistance is theoretically the most important factor making for efficiency of thrust to power, consequently for a given load and revolutions the diameter must be adjusted so that the blade velocity will produce the required thrust with the angle of least resistance. If the load and the diameter are fixed then the revolutions must be adjusted for the same purpose. Any alteration in the angle is accompanied by a decrease in efficiency, but when the blade velocity is comparatively low a variable blade angle limited to a small range may be a means of producing a thrust approximately in direct proportion to the power applied to the shaft. When the blade velocity is high and a varying blade angle therefore almost necessarily accompanied by an appreciable change in the effective value of the slip stream velocity the total thrust will no longer be even approximately in direct proportion to the power expended. Practical considerations, such as the fact that each part of the blade travels at a different speed so that if the slip stream is given a uniform value the blade angle will have to vary from root to tip and consequently vary in efficiency, shows that the angle of least resistance is a compromise that must be determined by experiment and also suggests, what is known to be true in practice, that there is a practical limit to the number of useful blades in a given screw.



CORRESPONDENCE.

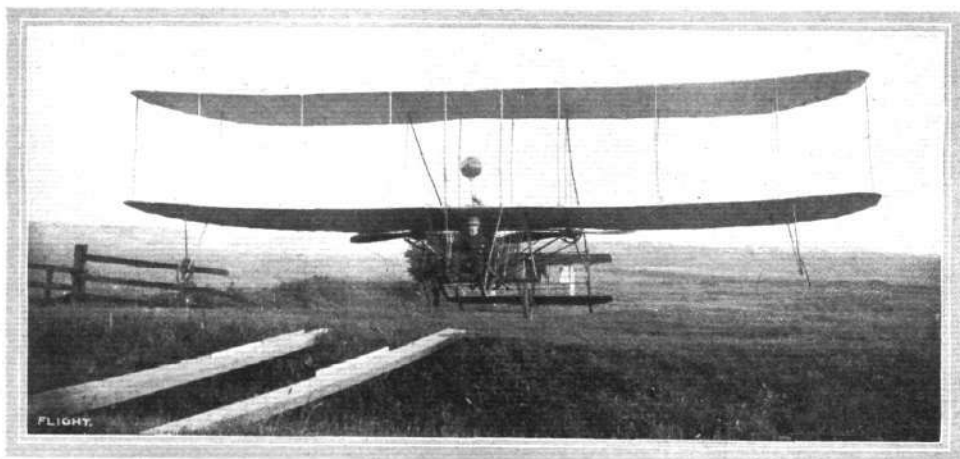
* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents communicating with regard to letters which they have read in FLIGHT, would much facilitate ready reference by quoting the number of each such letter.

PENDULUM STABILITY.

[924] I have seen numerous letters in your paper on pendulum stability, and your reply especially to Mr. Thos. Kelham, and I think you may be interested in hearing that we have our-

selves tested this pendulum theory to the uttermost, and I enclose you the photograph of a machine which is being daily flown, often for long distances, has been tried for weeks in every conceivable manner, such as for height, for going out in a strong wind, for turning in a short radius, and for going long distances, and has proved remarkably successful, and has been entered for the De Forest prize to France. On one occasion it started with a monoplane and a biplane at Freshfield to go a given distance, turn round a given



PENDULUM STABILITY.—Planes, Limited, biplane.

point, and come back again. For about half a mile of this distance our aviator informs us that he hardly once put his hand to the steering and elevating lever, and all the bystanders agreed that its flight was wonderfully steady as compared both with the monoplane and the other biplane which accompanied it. It alone of the three machines was able to go round the goal point owing to the strong current, the other two having had to come to earth, and our aviator, Mr. Fenwick, informs us that, in his opinion, it is a much easier and safer machine to manage than one with the weight nearer the centre of gravity. This machine has been patented under various patents ranging from 1906 on.

6, Lord Street,
Liverpool.

PLANES, LTD.
CHAS. LESLIE, Secretary.

CLASSIFICATION OF AEROPLANES.

[925] Mr. E. W. Twining's suggestion for the classification of aeroplanes on the same lines as used in locomotive engineering is, I think, an excellent one.

This method is simplicity itself, and once universally adopted and recognised, will prove a big time saver.

Perhaps the letter T could be substituted with advantage where a tractor screw is employed, viz., Blériot type, &c., would read o-T-1-1.

Lowestoft.

LEWIS E. RICHARDS.

[926] I am writing to correct one or two printer's errors which crept into my last letter. In the list of formulae the "Blériot XI" was given as c.c. o-p-1 (w)-(L_E)-R₂₅. The c.c., of course, stands for "cross-Channel" and should come after the name, thus—Blériot (c.c.) . . . o-p-1 (w), &c. I hope that no one was confused by this, as it certainly makes the formula look rather peculiar. The other mistake was that the elevator of the Cody was given E² and should, of course, be E₂.

Having rather laboriously fought my way through Mr. Robinson's involved letter, I have come to the conclusion that of the two systems mine is the more easily understandable and I think admits of a more complete picture of the machine being obtained. The hyphens Mr. Twining and I use are used to denote that the parts separated by the hyphen are separated in the machine by the fuselage. If the letters are placed directly behind one another it means that the two planes in question are joined together. Thus, the flap at the tail of a Farman is (L²R²) E, not (L²R²)-E. I think that there is an essential difference between Mr. Twining's formulae and those advocated by Mr. Robinson and myself. The former are of use in assigning a machine to its own particular "type" or "class," while the more extended form is of use in giving a concentrated "tabloid" picture of the machine.

I should like to see Mr. Robinson's formulae for the following machines, which come quite easily by my system, and, I think, would give him some trouble to portray by his, namely: The old Voisin, the "Neale VII," the 1910 Cody, and the Goupy and Breguet biplanes.

Cambridge.

R. M. HAINES.

THE WAR OFFICE AND FRENCH AEROPLANES.

[927] I am unable to agree with a single point your correspondent, Mr. G. Holt Thomas, or yourselves raise in supporting our Government for buying French aeroplanes, including an experimental one, namely, the new Paulhan machine.

Mr. Thomas refers to its being unfair for English manufacturers to offer our Government copies of the Farman machine.

Mr. Farman, I understand, claims by his patent taken out in 1909 to the combination of wheels and skids, but wheels and skids are shown in my patent taken out in 1906.

Mr. Thomas says it is impossible to purchase copies with latest improvements, as any copy must necessarily be behindhand. Latest improvements are not always improvements, and it is very unlikely the Government will get anything but the standard military Farman, which is the ordinary Farman with extended planes, that we know so well, and has been made successfully by several English manufacturers.

If anything the English products would be of sounder construction than the French, and it is far better that our money should help to build up the English industries than our foreign rivals'.

As a matter of fact the very latest Farman has its engine in front and is more like our own type, which is becoming popular in France, no doubt owing to the safety of the driver and passengers (not sitting in front of the engine), and the success of the Breguet and Goupy machines.

Mr. Thomas also informs you that he has come to an arrangement between Farman Bros. and Paulhan to supply their machines British built in this country. It is a pity English capitalists go abroad to help our foreign rivals, who have already received considerable help from their own country and ours, as well as from

Englishmen while in France, instead of helping their own countrymen's efforts.

I think the Government or wealthy Englishmen who would like to see England lead in aviation could considerably help on the movement by lending sound aeroplane engines to inventors who have shown some promise, and who although having sufficient money to build the aeroplane portion of the machine, have not enough to buy a really successful aeroplane engine.

A. V. ROE.

SPEED ALARMS.

[928] I have been very much interested with the different ideas illustrated in FLIGHT, but there is one important factor which seems to have been overlooked, i.e., the effect of head winds. Take, for example, the most simple suggestion, that of a horn receiving the inrush of air, the pressure of which forces back the diaphragm, allowing the air to pass through the alarm whistles; this diaphragm, being attached to a sleeve, is forced further back the greater the air pressure, thereby shutting off one whistle and opening the next, which is of a higher note, the higher note denoting the rate at which the machine is travelling. But suppose, for instance, the machine was flying at 20 m.p.h. the air pressure on the diaphragm would be so much, and a low tone whistle would be sounding; but, on the other hand, if there was a head wind of 20 m.p.h. the pressure would be very much more, and, although the machine would not be travelling at a greater speed, the higher toned whistle would be sounding.

When Mr. Grahame-White was flying at Bournemouth the wind was so strong that for some time he could make no headway. If we presume that the speed limit was 50 m.p.h. and the wind was then blowing at 60 m.p.h. the alarm whistle would be denoting a speed far above the limit, and yet, to all intents and purposes, the aeroplane would not be moving. Personally, I cannot conceive an instrument which would register both the pressure of air caused by the machine flying and the pressure of a head wind.

Wembley.

PERCEVAL MARTIN.

[Some confusion still seems to prevail among readers as to the basis of our Speed Alarm Competition, which has been closed since the 31st October. It should be recalled that our offer was made in connection with an article contributed by Capt. Dickson, in which he drew attention to certain dangers associated with a descent from high altitudes, and suggested that it would be useful to himself, and possibly to other aviators, to have some simple alarm that would give an audible indication when the speed exceeded some predetermined value. Capt. Dickson naturally thoroughly appreciates the fact that flight is relative to the wind and that any such instrument operated by the wind would merely sound the speed through the air. This was the basis on which we started the competition, and it has never been suggested by us that designs submitted should be attempts to solve any other problem. Many competitors have, as a matter of fact, sent in ideas for instruments to measure the angle of descent, and others have limited themselves to indicators that are not sound instruments, neither of which, although doubtless useful in themselves, have anything to do with the question at issue.—Ed.]

MODELS.

SHEFFIELD MODEL AERO CLUB.

[929] In answer to a letter appearing in your valuable paper of November 26th, I should like to say that Mr. C. Wightman, of the Sheffield and District Aero Club, is greatly mistaken in regard to not being as well informed as some of my fellow model enthusiasts. I would point out that other towns have model aero clubs, and why not Sheffield? I am pleased to say that members are rolling in to the above club, so all those wishing to join should do so without delay as the subscription will be raised when the club has reached the limited number of founder members. A meeting will be called in a few weeks.

35, Penrhyn Road, Sheffield.

C. F. W. CUDWORTH.

TRACTOR & PROPELLER.

[930] I would consider it a great favour if you or any of your readers could give me an explanation to the following query:—

I have made several experiments with model flyers (monoplanes), and have always had far better results as regards stability with monoplanes having the elevator in front and propeller at back, on the same principle as the well-known Clarke flyer—as for models with the elevator at back and propeller in front the results obtained were far from satisfactory; and yet all the leading full-size monoplanes have their propellers in front and the elevator at back, such as the Blériots, &c.

Supposing a full-size monoplane was constructed on the same principle as the Clarke flyer (elevator in front and propeller at back), would it have any advantage on the present system of monoplanes? Stourbridge Park. OWEN.

[It has always seemed to us that the diminishing slip-stream from the tractor-screw must affect the natural stability of models thus fitted, calling as it does for a variable attitude of the elevator during flight. The draught from the propeller situated behind flows clear of all surfaces. A correspondent recently suggested a device for an automatic tail.—E.D.]

MODEL DEMOISELLE.

[931] With regard to Mr. Lockett's letter (No. 717), I also am making a model Demoiselle, and would like to suggest the following methods of fixing an elastic motor. The enclosed sketches will, I hope, make the explanations clear. The wood used is $\frac{1}{2}$ -in. square section birch. At A and B a piece of wood is nailed and glued to



the framework, and at C is carefully bored to take the propeller-shaft. D is a piece of thin iron wire bent to form a skid, and passing through the horizontal tie-piece and top member of the framework, and projecting about $\frac{1}{8}$ in. above the latter, so that it can stick into the piece of wood, E, which is then glued in position. F is a tension-wire, the most suitable kind, to my mind, being that sold by florists at 1d. a reel.

A geared motor, I should say, could be most easily fitted by putting the elastic inside the framework, and by putting the gearing-wheels one above the other on the member AB. Another piece of wood, G, would then have to be added parallel to AB, to take the other end of the axle of the propeller.

Cowes.

D. E. MOISELLE.

CAMBERING RIBS.

[932] I should advise Mr. A. G. Adams (731) to curve the ribs of his plane by steaming them. If the desired curve is drawn on paper, the ribs, after being softened in the steam from a kettle spout, can be easily bent to that curve, and if they are tied in a bundle, one on top of the other, before they have dried, and are lightly steamed again, this will ensure them all drying and hardening into the same shape.

The most suitable amount of incidence can best be found by experiment.

With regard to fixing one plane above the other, I did not see letter No. 632, but I may mention that I have had trouble with planes supported on stanchions from several causes, and that I now construct the frame of four fore and aft members, and fix the planes to these. I have found built up planes unsatisfactory, and am now trying thin wood.

Liverpool.

S. P. ELLIOTT, Lieut. R.N.R.

QUERIES.

[933] A. Lowe (Newtown) inquires as to the best power to drive a model Farman biplane of 3 ft. span, weighing about 7 ozs. without wheels and motor. The lifting area is about 537 ins.

[934] J. Russell (Clapham) would be glad to hear from any readers who have had experience with miniature petrol motors. He wants to know what horse-power would be required to drive a model of from 3 to $3\frac{1}{2}$ ft. span.

[935] "A Beginner" (Lowestoft) wishes to know the best models to commence building, as he has had no experience, and has not seen an aeroplane or balloon. He wishes to have weight, measurements, materials, &c., of such models.

[936] J. W. Lane (Wolverton) wishes to have particulars of the Ridley kite which was illustrated in these columns a little while ago.

REPLY.

[937] E. A. Earley (North Kensington). The model aeroplane you mention should fly quite satisfactorily with a propeller if properly balanced.

AIRSHIP NEWS.

The Willows Airship.

ON Saturday last Mr. Willows made another attempt to complete his journey to Paris by airship, and started off from Lamotte-Breuil at half-past ten. The fog was very dense, and Mr. Willows was obliged to steer his ship entirely by the compass. His difficulties were added to by the intense cold freezing up the carburettor. From this cause the engine ran very erratically, and was at last put out of commission by a shaft breaking when the airship was passing over Rully. An easy landing was made, and the shaft repaired, after which the airship rose again and made a fresh start in the dark. While over Senlis the motor stopped again, owing to the frost, and the airship drifted on for some little way, eventually a suitable landing place presenting itself at Albert, and there Mr. Willows descended. After waiting on Monday for the wind to change, Mr. Willows decided, as the balloon had lost a quantity of gas, to deflate it and send it back to Lamotte-Breuil in order to make a fresh start.

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- 25,548. H. WERNER. Projectile for use against balloons.
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- 1,017. G. PLAISANT. Aerial machines, with a view to diminish atmospheric resistance to motion.
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- 2,619. M. S. RJELOVUCIC. Propelling airships.

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